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Inclusive growth? The relationship between economic growth and poverty in British cities

Article (Accepted version) (Refereed)

Inclusive growth? The relationship between economic growth and poverty in British cities

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Abstract

There is growing concern in many developed economies that the benefits of economic growth are not shared equitably. This is particularly the case in the UK, where economic growth has been geographically uneven and often biased towards already affluent cities. Yet there is relatively little evidence on the relationship between growth and poverty in the UK. This paper addresses this gap with an analysis of the links between economic growth and poverty in British cities between 2000 – 2008. We find little evidence that output growth reduced poverty. While growth was associated with wage increases at the top of the distribution, it was not associated with wage growth below the median. And there was no relationship between economic growth and the low skilled employment rate. These results suggest that growth in this period was far from inclusive.

Keywords: Growth, Poverty, Cities, Social Exclusion, Great Britain
JEL: R11; R23; I32; I38

1. Introduction

There is now increasing concern in many countries that the benefits of economic growth are not shared equally (Resolution Foundation et al., 2013; Furman, 2014; OECD, 2014). There has long been an assumption that growth would increase incomes across the board and so reduce poverty (McCulloch, 2003; Partridge & Rickman, 2008a). This view has been supported by the experience of many countries in the global South, which saw strong economic growth alongside significant poverty reduction (Dollar, Kleineberg, & Kraay, 2013). It has led urban and regional policymakers to attempt to stimulate economic growth on the basis that a "rising tide" will "lift all metropolitan boats" (Partridge & Rickman, 2008b: 283).

Yet the recent experience of UK cities does not seem to have born this out. Economic and employment growth in the 2000's was focused on London and cities in the south of the country (Champion & Townsend, 2011, 2013; Gardiner et al., 2013). Poverty rates fell in many post-industrial cities of the North and Midlands (Author 1, 2014). These were often the areas with the highest rates of poverty to begin with (Fahmy et al. 2011), but the reduction in poverty across the UK was largely due to redistribution rather than wage or employment growth (Brewer, 2012). Indeed, poverty actually increased in this period in the most economically successful city of all, London (New Policy Institute, 2013). This raises a number of important questions: To what extent did urban growth in this period reduce poverty? And was growth associated with rising incomes for low wage workers or increasing inequality?

Despite "increasing interest in the spatial distribution of poverty" (Fahmy et al, 2011: 611) in the UK, and significant concerns about the growth of disparities between cities, no study – as far as we are aware - has directly addressed the question of the relationship between growth, poverty and inequality in British cities over the 2000s. This is an important omission for a number of reasons. For theory in this area, investigating the links between cities, growth and poverty can help illustrate the way the changing economy affects different groups. For policymakers, understanding this relationship helps inform attempts to reduce poverty (OECD, 2014). A focus on cities is important both for theory and policy: cities are now seen by academics as important for economic growth (Storper, 2013); in Great Britain they are also being given new powers and responsibilities both to stimulate growth and address poverty (Pike et al., 2012; Lee et al., 2014).

At the same time, there is increasing interest in the notion of inclusive growth: the idea that growth alone is not sufficient as a policy target and so the distribution of the benefits also matters (Turok, 2010; Summers and Balls, 2015). While the concept was initially used in the Global South (e.g. World Bank, 2012), its use has become widespread. For example, the European Union now has inclusive growth as an important aim of policy (European

Commission, 2014), as do strategies such as the Scottish Government's economic strategy (Scottish Government, 2015). Cities are seen as important in the inclusive growth agenda, and the OECD has launched a campaign to encourage cities to develop policies orientated towards inclusive growth (OECD, 2016). Yet there is relatively little research on the distributional aspects of urban economic growth and what this means for the inclusive growth agenda.

This paper investigates the relationship between economic growth and poverty in British cities between 2001 and 2008. There is no consistent time-series of poverty statistics available at the sub-regional level in the UK, so we use a novel measure developed by Fenton (2013) which proxies poverty through benefits claiming and which correlates very closely to other measures of poverty. We also relate economic growth to the employment rate for those with low levels of qualifications and different wages percentiles. This allows us to make inferences about the impact of growth on in-work poverty, an area of increasing concern in Great Britain (Wills & Linneker, 2014). Our results suggest that urban economic growth in this period had little impact on poverty but contributed to increasing wage inequality.

There is a growing body of evidence investigating the links between growth and poverty at a sub-national level. Evidence for the global south suggests that, while growth can be positive for the incomes of the poor, the relationship depends on context and in particular the spatial and sectoral 'composition of growth' (Kraay, 2006; Loayza & Raddatz, 2010). Research for developed economies suggests a relationship between local employment growth and reduced poverty, although the relationship depends on local context (Partridge & Rickman, 2008a). Studies have also begun to consider the links between factors associated with growth, such as innovation or clusters, and poverty and inequality (Goetz et al., 2011; Breau, Kogler, & Bolton, 2014; Fowler & Kleit, 2014; Lee & Rodríguez Pose, 2016). In one of the few UK studies on this topic, McCulloch (2003) finds that local employment growth is associated with a higher probability of exiting poverty. At the same time, there has also been increasing concern about growing inequality nationally (Piketty, 2014) and in cities with strong economies (Bolton & Breau, 2011; Lupton et al., 2013; van der Waal & Burgers, 2009).

The paper makes a number of contributions to this literature. Our main contribution is as the first study to quantitatively investigate the link between economic growth and poverty in British cities. In doing so it also adds a British focus to a developing literature on the links between geography and poverty in the US, and extends this literature to focus on output rather than employment growth (Fowler & Kleit, 2014; Strait, 2001; Wang, Kleit, Cover, & Fowler, 2011). It also extends the literature on uneven development in the UK (Green, 1988; Gardiner et al. 2013), by showing the distributional results on growth. Most work in this area has used cross-sectional

models which are vulnerable to causality problems, so we use a panel data model and instrumental variable (IV) estimators to allay concerns about endogeneity (Partridge, 2005; Partridge & Rickman, 2008b; Rupasingha & Goetz, 2011). And it contributes to the developing literature on the sub-national dimensions of economic inequality and policy around inclusive growth (Florida & Mellander, 2014; Glaeser, Resseger, & Tobio, 2009; Turok, 2010).

The paper is structured as follows. In section two we review the literature on the links between economic growth, poverty and inequality at a city level. Section three describes the dataset we use to investigate these issues. Section four presents results of panel models of the determinants of poverty. To isolate the channels through which growth may be influencing poverty, section five considers the relationship between growth and the low-skill labour market. Section six concludes and gives potential implications for policy.

2. Cities, growth and poverty reduction

Economic growth and poverty in the UK

There is a general assumption that growth will reduce poverty as the benefits will be shared equitably or, at least, trickle down to the less affluent. This is assumption is supported by a literature on the experience of developing countries (Dollar et al., 2013; Dollar & Kraay, 2002; Ferreira, Leite, & Ravallion, 2010; Kraay, 2006; Loayza & Raddatz, 2010). Focusing on the examples of India, China and East Asia, this research has tended to find a positive relationship between economic growth and poverty. There is also sub-national research on this topic for developing countries. For example, Ferreira et al. (2010) show that output growth reduces poverty in a panel of Brazilian states, but that service output growth had a larger effect than industry or agriculture. In contrast to this, studies of the developed world in the 2000s were highlighting the apparent but contested disconnect between growth and incomes for much of the population (Pessoa and Van Reenen, 2013) and the growing problem of inequality in the UK (Dorling, 2012). This has led to the concern that relying on growth alone is an ineffective way of reducing poverty (OECD, 2014).

There are two primary ways through which growth at city level can reduce poverty: by raising wages and/or increasing employment. In standard theory, productivity growth should raise the bargaining power of labour and raise wages. Skills shortages may develop, forcing employers to increase wages (Houston, 2005). As wages comprise the majority of household incomes, this should then reduce poverty. But, while this may happen in some contexts, the link between productivity growth and wages may have broken down in the 2000s. In the US, for example, productivity growth in the 2000s led to an increased income share for those at the top of the wage distribution, but did not increase median wages (Mishel, Bernstein, & Shierhol, 2009). Similar patterns were observed for the UK, with the benefits of increasing productivity going to profits and high-earners rather than low-wage workers (Lansley & Reed, 2013). Active labour market policy may also have reduced the bargaining power of workers at the lower end of the wage distribution, reducing the responsiveness of wages to labour demand. So it is not clear whether economic growth in cities would lead to wage growth and so poverty reduction.

The second direct way in which growth may reduce poverty is through employment growth, although the extent to which this reduces poverty depends crucially on the scale and type of new employment. Employment growth may reduce poverty by drawing people into paid work (Partridge & Rickman, 2008b). Increased labour demand may raise wages as other employers seek to recruit and retain staff, while increased employment may also provide opportunities for workers to move to better paid new jobs (Phimister, Theodossiou, & Upward, 2006). This effect

may be particularly pronounced in already tight labour markets, as employers become willing to employ workers who would otherwise not be able to find employment (Partridge & Rickman, 2008b). Because of this, these two factors – wages and employment – can be inter-related, with strong growth in one associated with growth in the other.

It may even be that growth focused on high-wage earners may benefit those at risk of poverty through localised spillovers. Sassen's (2001) famous work suggests that affluent knowledge workers in global cities may create jobs in personal service work nearby in the local economy. Kaplanis (2010a; 2010b) shows that these spillovers operate in British cities more generally, as concentrations of degree-educated workers increase wages and employment chances for less well educated residents of the same city. Jones and Green (2009) provide evidence of growing employment polarization in all UK regions except Northern Ireland which is also consistent with this view. However, this might not be enough to reduce poverty. Essletzbichler (2015) shows that incomes in US cities with high shares of the 1% most affluent residents are no higher for normal residents than elsewhere, once cost of living is taken into account.

There are three important caveats to the view that employment will always reduce poverty. First, many of those in employment remain poor. The UK has high rates of in-work poverty (Wills & Linneker, 2014). The extent to which employment growth reduces poverty will depend on the quality of employment in terms of hours worked and wage levels as well as the quantity of jobs (Jones & Green, 2009). Urban job creation is not always in high wage occupations and many cities have experienced significant increases in the share of low wage jobs in their labour markets (Gordon & Kaplanis, 2014). Second, new employment opportunities must go to groups in-poverty. The UK has seen increasing polarisation between work-rich and work-poor households (Gregg & Wadsworth, 2004). Employment growth will not reduce poverty if new jobs go to second earners in non-poor households. Spatial factors will influence this relationship – with transport infrastructure and costs providing barriers to employment and limiting the extent to which local residents can take new employment opportunities (Partridge & Rickman, 2008b). Third, in open urban economies adjustments in labour demand may simply lead to in-commuting or in-migration (Gordon and Turok, 2005; Partridge & Rickman, 2008b; Gordon, 2011), weakening the relationship between growth and poverty reduction. So the closed economy view of growth leading to benefits may be weakened by spatial adjustment mechanisms in porous city economies.

Evidence on economic growth and poverty reduction

One study which considers the relationship between poverty and local labour market conditions is McCulloch (2003). Using British Household Panel Survey (BHPS) microdata for the 1990s, he

shows that employment growth in a local area is positively associated with the probability of leaving poverty and negatively associated with the probability of entering poverty. However, he notes that family composition and personal characteristics are far more important predictors of poverty than the local labour market. Research on the United States by Partridge and Rickman (2008a, 2008b) highlights the potential of employment creation for poverty reduction. In one paper (2008b) using cross-sectional regression they show that employment growth reduces poverty in US counties. In a second paper (2008a: 305), they also investigate employment growth by sector, but while they find "overall employment growth" reduces poverty they find no effect from manufacturing or retail specifically, contrary to expectations as these are sectors which are expected to employ those at risk of poverty and, in the case of manufacturing, to provide higher quality mid-skill employment. To address potential endogeneity challenges in the relationship between growth and poverty they use a growth measure calculated based on industry shares in an earlier period and subsequent national level growth.

Other studies have begun to relate different aspects of economic development to poverty. For example, Fowler & Kleit (2014) link the development of specialised industrial clusters to the poverty rate in US counties and find a negative relationship, with clusters reducing poverty even when controlling for measures of economic strength such as the unemployment rate. They note, however, that longitudinal work would develop their results by better assessing causality. Considering the link between innovation processes and the wage distribution in both Europe and the United States, Lee and Rodríguez-Pose (2013) find some evidence that innovation increases inequality in Europe but not in the United States – the positive relationship is also shown to exist in Canada by Breau et al. (2014). They also find that measures of economic growth are in some cases associated with reduced wage inequality, perhaps suggesting the gains from growth go to the poor.

3. The model and data

The model

To investigate the relationship between growth and poverty we estimate a set of panel data models. The basic model assumes that poverty is a function of both the local economy and the local population:

$$Poverty_{it} = \alpha + \beta_1 Growth_{it} + \beta_2 Demography_{it} + \beta_3 Skills_{it} + v_i + \varepsilon_{it} \qquad (1)$$

For city 'i' in time 't' where 'growth' is one measure of output growth, 'demography' is a set of controls for the structure of the population and 'skills' are their qualifications. The constant is α while v is the time-invariant error and the remaining error is ε. We first consider the simple relationship between economic growth and poverty, before introducing controls for other demographic and skills related factors.

The challenge in our empirical strategy is that growth and poverty are likely to have a two-way relationship, with poverty levels both *determined* by and a *determinant* of growth rates. This makes it hard to reliably assess if growth has a separate effect in reducing poverty independent from the effect of poverty on growth. For example, one way of investigating the growth-poverty relationship would be to use a cross-sectional model and see whether, controlling for other factors, recent growth was associated with lower poverty. But as poverty may reduce subsequent growth rates, any relationship would be unclear because of this two-way relationship. We address this challenge in two ways. First, we use a fixed effects specification, where we essentially look at whether year-on-year changes in growth are associated with similar changes in the poverty (UMBR) rate. The fixed effects remove any time-invariant city level factors, such as the location of a city or resource endowments, and so partially addresses these causality concerns. It also greatly extends the sample size as we investigate year-on-year variation for the period 2001-2008 giving a total of 480 observations. But this does not fully solve the problem, as exogenous shocks to poverty rates, such as the closure of a local employer, may still have an influence on both growth and poverty. Because of this, we also adopt a second approach, an instrumental variable model, where we use predicted growth rates which are detached from any year on year exogenous shocks to poverty to investigate whether a causal relationship exists.

Cities in Great Britain

The analysis focuses on British cities, of which there is no standard official definition such as the US Metropolitan Statistical Area (MSA). We focus on the cities included in the State of the English Cities Database (SOCD), a comprehensive mapping exercise which identified the largest

cities in England (Parkinson et al, 2006). These were defined in a manner closest to an officially used functional economic area available. Since then, the cities used have become increasingly popular both with policy researchers and academics (see, for example, Lee 2014). As the SOCD only includes data for English cities, we also include the largest cities in Scotland and Wales. The SOCD is also based on TTWA definitions from the 1991 Census, so we update it to include the 2001 TTWAs as this is the start of our period of analysis. Because of changes in the TTWAs this means we make some minor changes to the sample of cities included.[1] Unfortunately, there are a large number of missing variables for Northern Ireland so we estimate our models for Britain alone.

As the focus of this paper is on labour markets, for each 'city' we use the 2001 Travel to Work Areas (TTWAs) as the boundaries for the city. TTWAs are a measure of labour market functionality based on areas where at least three quarters of those living in the TTWA also work there. Full details on TTWAs in Britain can be found in Coombes and Bond (2008). However, as many of the control variables we use are only available at a local authority level, we follow Kaplanis (2010b) and define TTWAs as being composed of their constituent local authorities – adapting his approach so that each local authority is allocated into a single TTWA.[2] This gives us a panel of cities with consistent boundaries over the period. The final sample is 60 cities for 8 years, giving a total of 480 observations.

Defining poverty

There are a number of different definitions of poverty and ways of measuring it (see Fahmy et al. 2011 or Cribb et al. 2013). Official poverty estimates in the UK draw largely on two measures. The first is relative poverty, a measure of the number of households with income of less than 60 per cent of the national median, adjusted for household size. A second measure, absolute poverty, measures incomes against a fixed-year. National level poverty estimates are derived from

[1]In Parkinson et al. 2006 older TTWA boundaries are used so we update these and add the major Scottish and Welsh cities. Additions from the SOCD are highlighted with a * and changes noted in parenthesis. Our final list of TTWAs is: Aberdeen*; Barnsley; Birmingham; Blackburn; Blackpool; Bolton; Bournemouth; Bradford; Brighton; Bristol; Burnley, Nelson and Colne (replacing Burnley); Cambridge; Cardiff; Coventry; Crawley; Derby; Doncaster; Edinburgh*; Glasgow*; Gloucester; Grimsby; Guildford and Aldershot (replacing Aldershot); Hastings; Huddersfield; Hull; Ipswich; Leeds; Leicester; Liverpool; London; Luton and Watford; Maidstone and North Kent (replacing Chatham); Manchester; Mansfield; Middlesbrough and Stockton (replacing Middlesbrough); Milton Keynes and Aylesbury (replacing Milton Keynes); Newcastle and Durham (replacing Newcastle); Northampton and Wellingborough (replacing Northampton); Norwich; Nottingham; Oxford; Peterborough; Plymouth; Portsmouth; Preston; Reading and Bracknell; Rochdale and Oldham; Sheffield and Rotherham (replacing Sheffield); Southampton; Southend and Brentwood (replacing Southend); Stoke; Sunderland; Swansea Bay*; Swindon; Telford and Bridgnorth; Wakefield and Castleford; Warrington and Wigan (replacing Warrington and Wigan); Wirral and Ellesmere Port (replacing Birkenhead); Worthing; York.

[2] See also Nathan (2010) or Lee (2014) for similar applications of these approaches.

survey data collected annually by the Family Resources Survey (FRS). The FRS can also be used to derive regional estimates. However, because of the sampling method and size, the FRS cannot be used to derive estimates at a city or local level. Local measures which attempt to estimate the level of poverty have therefore typically used administrative benefits data as a proxy. The measures adopted here build on and extend this type of approach.

Our measure of poverty is the Unadjusted Means-Tested Benefits Rate (UMBR)[3] which represents an annual average of the proportion of households which claim a number of major means-tested out-of-work benefits (Jobseeker's Allowance, Income Support, Pension Credit [since 2003][4], and Employment and Support Allowance [since 2008]).[5] This builds on the work carried out by Fenton and Lupton (see Fenton, 2013; Lupton et al, 2013).

UMBR is closely related to other measures of poverty. It is also strongly correlated to wider measures of area deprivation (Gambaro et al., 2014). The extent to which UMBR effectively proxies for income poverty can be gauged by testing the measure's coverage and validity against national estimates from the FRS which contain both income and benefits information (see Fenton, 2013). The validity is the proportion of households captured by each UMBR who are also in income poverty. The coverage is the proportion of all poor households identified by the measure. The estimates of validity are 47 and 62 per cent respectively for poverty measures using 60 and 70 per cent of median income after housing costs. The coverage is lower, at 30 per cent, although underreporting of benefits data is known to be an issue in surveys such as the FRS so this figure is likely to be an underestimate (Fenton, 2013).

Tests on the UMBR data for different years at the national and regional level show that a lower UMBR rate is strongly associated with a lower incidence of income poverty (although the precise relationship with income poverty is subject to modest fluctuations over the period, for full details see Fenton, 2013). The UMBR estimates also correlate strongly with local poverty estimates previously made by the Office for National Statistics (ONS) for a single year only, 2007-2008 (see Fry, 2010). Previous analysis has also shown UMBR to be closely correlated to Housing Benefit receipt at a city level (a benefit available to low-income renters whether they are in or out of work) (Author 1, 2014). UMBR's main weakness is the lack of coverage of those in-work and in-poverty, and this is a growing component of poverty in the UK.

[3] It is 'unadjusted' in the sense that the raw rate is used and potential spatial differences in validity and coverage cannot be estimated.
[4] Note that tests suggest that the inclusion of pension credit does not significantly impact on our results. The inclusion of Employment and Support Allowance, which was phased in, has a very small effect on the 2008 figures (of less than 0.40 per cent in each city).
[5] Note that testing with different combinations of benefits or time periods makes little difference to the core results.

UMBR represents a novel way of assessing local poverty rates and provides a reasonable proxy, but as with all such indicators there are some potential limitations. The central issue, given the nature of the results we present, is whether it is likely that UMBR underestimates poverty change in relation to growth vis-à-vis income based estimates. We have run a number of sensitivity checks to assess this. Our indicator is closely correlated in a panel regression model with an alternative measure of poverty, Housing Benefit receipt (a benefit available to low-income renters whether they are in or out of work).[6] We also triangulate the use of UMBR with other measures of worker pay and employment rates of low-skilled workers (as described later in this paper).

In the UK, around half of all people leaving poverty do so because their earnings increase rather than because they enter employment (DWP, 2010). Because UMBR is partly calculated using out-of-work benefits this might bias our results. However, most poverty transitions are short-term mobility around the poverty line rather than long-term exits from poverty (as Hills, 2014, sets out incomes for low-earners can be very variable from one year to the next). We would also expect employment growth and wage growth for low earners to be highly related. Moreover, our wage estimations do not support the idea of a significant growth premium experienced by low-paid workers over the period of analysis. Our analysis of the employment rate of low-skilled workers is also consistent with the UMBR results and this interpretation. These findings support our confidence in the robustness of the results presented.

Insert figure 1 around here

This measure gives an indicator of the cities with the highest rates of poverty in the UK. The cities with the highest rate of poverty in 2001 were Liverpool (36%), Glasgow (33%), Sunderland (30%), Newcastle (29%) and Middlesborough and Stockton (29%). These tend to be relatively large cities which had experienced post-industrial decline. The data can also show which cities has experienced reductions in poverty, and we document a convergence of poverty rates in the UK over this period as these high-poverty cities experienced the largest reductions. Figure 1 shows this general pattern, with a clear, albeit far from perfect, relationship between poverty and poverty change. Indeed, the cities with the largest falls were in Glasgow (-3.1%), Liverpool (-2.6%), Newcastle (-2.5%).

Measures of economic growth

There are several ways of defining 'growth'. One division is between growth in 'labour productivity' - the amount produced per worker – and growth in the total size of the urban

[6] Note that, due to data availability data from 2003 – 2008 is used to test this.

economy. In some circumstances, labour productivity may decline as employment increases, if new employment is in low-productivity sectors – a situation experienced in the UK following the 2008 financial crisis (Dolphin and Hatfield, 2015). Similarly, if growth is associated with in-migration it might be that output per capita declines even as the size of the economy increases. While cross-national work has tended to use indicators of output as a growth indicator, national studies have focused on employment growth.

The focus of our investigation into economic growth is Gross Value Added (GVA). GVA is published at the NUTs 3 level in Britain – a relatively small unit indicator of GVA, but one which does not map directly on to our definitions of 'cities'. To address this problem we use the following approach to allocation: first, we calculate GVA per worker for each sector in the NUTS3 region; next, we establish the number of workers in each TTWA and assume they have the average productivity of workers in their sector / NUTS3 combination (as workers in the same TTWA may be in different NUTS3 regions); finally, we aggregate to overall TTWA GVA measures. For example, assume we have a NUTS2 area which consists of two local authorities, but where each local authority is in a different TTWA. Considering just manufacturing, each manufacturing worker in the each local authority is given the average productivity of manufacturing workers in the NUTS area; each manufacturing worker is then allocated to the TTWA based on their local authority. The output from all manufacturing workers in each TTWA can then be summed to create total and per capita figures. This means that sectoral productivity is still calculated at a relatively local level, but with some relatively minor adjustments to translate it to the TTWA area. Given the limitations of any local level indicator of GVA, this methodology provides the best approximation at a TTWA level. While there will be issues with identification at a local level, our focus on the 60 largest cities should minimize these problems.

We include three measure of the growth rate of GVA: (1) the percentage growth rate of GVA per capita, (2) the percentage growth rate of GVA per worker and, (3) the percentage total GVA growth rate as might be used in the national accounts. The growth rate of per capita GVA will give a measure of economic growth closest to those related to national income, but will be affected by changes in the non-working population. GVA per worker is a measure of productivity. Total GVA gives an overall measure of the size of the urban economy. In addition to including these rates, we include two measures in levels. These are (4) the log of GVA per capita (ln) and (5) the log of GVA per worker. These are included as growth rates may be skewed by lower initial values, and so including values in levels allows us to investigate whether absolute levels of economic development matter. All per capita measures only include the population aged 16 and above.

The results of this exercise show a relatively familiar pattern to observers of UK urban change. Considering annual average growth rates in GVA per worker in the period 2001-2008, the cities which experienced the fastest growth were London (5.1%), Milton Keynes (5%) Edinburgh (5%), Reading (4.8%) and Ipswich (4.7%), cities which tended to focus on the finance and business services industries which were growing in this period. In contrast, the slowest rates were in Wakefield (1.8%), Coventry (2.5%), Swansea (2.5%), Barnsley (2.8%) and Sunderland (2.8%). Our results reflect the growing North-South divide in the period, but also show a more local pattern of slow growth in Wales and the Midlands. However, there was no correlation between this indicator of economic growth and poverty reduction. A simple pairwise correlation coefficient between the indicator of GVA per worker increase over 2001 - 2008 and the poverty change outlined above is 0.1221 and not close to statistical significance. This simple test provides the first evidence that growth may not have been poverty reducing.

Control variables

We control for a series of variables, each of which may have a significant influence on poverty. Past research has shown that personal and family characteristics are the most important determinants of poverty, so we focus our control variables on demographic factors (McCulluch, 2003). Moreover, we face a challenge as many local characteristics such as sector are likely to be closely related or endogenous with growth. Variables are all calculated as annual averages from the Labour Force Survey (LFS). Descriptive statistics are given in table 1.

Insert table 1 around here

We control for demographic structure with three variables: the share of lone parents, females and those under 16 in the population. Single-parenthood reduces the incentives to work, as childcare consumes a significant proportion of earnings and caring arrangements may become harder (Stewart, 2014). We expect the share of lone parents to be positively associated with poverty.

Women are also more at risk of poverty than males in the UK. Wages are lower for females, who are at a greater risk of in-work poverty (Stewart, 2014). Gender discrimination in the labour market can lead to lower wages and there is still an earning and unemployment penalty associated with motherhood. Yet, as we also control individually for these effects the relationship between poverty and the share of women in the area is ambiguous.

The third demographic variable is the share of the population aged under 16. This is essentially a proxy for parenthood. Where there are more children in the local area, this is likely to increase poverty rates as they are strongly related to household size.

We also control for two other sets of population characteristics. Most importantly, we control for the skills of the population. As is common in empirical work, we proxy the notion of 'skills' through a measure of education: the share of degree holders in the TTWA. Better educated workers are less likely to be unemployed and more likely to earn high wages. There may also be spillovers from high-skilled workers to wages and employment for low skilled workers (Kaplanis, 2010a; 2010b) Because of this, we expect the share of workers with degrees to be negatively associated with poverty.

A control for international migration is also used – the share of the population born overseas. The effect here may be unclear as some migrant groups are less likely to be successful in the labour market, yet others perform better than the native population.

In all regressions we include a set of year fixed effects. These are intended to capture cyclical changes in the national economy and other changes which will impact on the poverty rate. The final year of our data includes the year the UK entered recession. Investigation of changing poverty rates over this period suggest that the largest changes in poverty were only in the latter year. Moreover, any cyclical variation should be captured with the year fixed effects.

4. Economic growth and poverty: Regression results

Panel data regressions

We first consider the direct relationship between economic growth and the UMBR measure of poverty. Table 2 presents the results of the regression models linking urban economic growth and poverty rates in British cities. Regressions 1 – 5 include year dummies but not controls. The models are estimated as fixed effects panel regression models, so control for time-invariant city-specific factors such as regional location. Considering first the three growth rate measures (columns 1 – 3), only one of these – productivity growth, measured as GVA per worker – is negatively and statistically significant, indicating that growth may reduce poverty, albeit without controls. Of the two measures for overall development levels (columns 4 and 5), change in GVA per capita is not significant. However, total GVA is statistically significant and positive – indicating positive change in GVA per worker is actually associated with an increase in the share of those in poverty. Overall, these suggest that any relationship between growth and poverty is weak at best.

Insert table 2 around here

In columns 6 – 10 we include the full set of controls. Only one of the five measures of growth or economic development is statistically significant, and this – Total GVA growth rate – is only at the 10% level. However, controlling for other demographic factors and the skills of the workforce the results suggest no consistent relationship between growth and poverty in this period. In contrast to the dominant narrative of 'trickle-down' growth, the benefits of growth were not reaching those in poverty in this period.

This result is clear from the experience of some cities in the sample. London, for example, saw strong economic growth in the period, yet its poverty reduction performance was mediocre (Cunliffe et al., 2013). In contrast, there was above-average poverty reduction by the UMBR measure in a city like Barnsley, yet the growth performance of the city was mediocre. Rather than a simple case of growth reducing poverty, the relationship seemed to be more complicated and driven by local factors.

The control variables show that while economic growth is only loosely related with poverty, demographic factors do matter. Two demographic variables – the share of the population aged under 16 and the share who are female – are positively associated with poverty, in line with other evidence that female headed households and those with children are more likely to be poor. The share of lone parents did not, in contrast to expectations, seem to impact on the poverty rate.

Neither did the share of the population with degree. One explanation for this is that over this period the public sector, which is relatively graduate intensive, was expanding, and the share of degree holders in many cities was increasing on the basis of this, rather than for other economic reasons. Migration was also unimportant, perhaps reflecting the polarised nature of migrants in Britain who suffer from lower employment rates than natives but are more polarised into higher- and lower-qualified groups (Dustmann & Frattini, 2011).

Instrumental variable analysis

One problem in this model is the possibility of endogeneity and, more specifically, simultaneity between growth and poverty. This may bias the relationship between growth and poverty if, for example, high levels of poverty in t_0 reduces economic growth in t_1. This is entirely feasible as high levels of poverty may reduce consumer demand and so hinder local economic growth. Alternatively, however, the causality may be reversed: poverty may be reflected in lower prices for land and labour and this will then attract new employment, meaning higher economic growth. The problem is that this potential two-way relationship is not controlled for in the fixed effects model and it might bias the coefficient on the growth variable and mean that we cannot be confident that the observed relationship is correct.

Our solution is an instrumental variable (IV) approach. This requires an IV which is correlated to economic growth but has no theoretical link to changes in poverty. Following a common approach in the migration literature, we use a shift-share approach (see Ottaviano and Peri 2005 for a similar application). We take the initial share of output by sector in the city in 1998 and assume that each sector then grows at the actual national trend over the subsequent 10 years. The result should be correlated with economic growth but independent of changes in poverty over this period. This is a similar instrument to that used by Partridge and Rickman (2008a). Essentially, this is a check against two potential problems: (a) economic growth inducing in flows of people at risk of poverty or (b) that poverty serves as a short-term drag on subsequent growth rates. Both of these would bias down the coefficient on the growth variable, so we need an exogenous variable to test whether the result is robust.

Insert table 3 around here

Table 3 gives the results of the analysis. F-tests and first stage results suggest that this is not a weak instrument and the magnitude of the coefficients is similar to that in the previous results. But in no case do they suggest that there is a statistically significant relationship between economic growth and poverty. These results support our previous interpretation that there was little relationship between economic growth and poverty reduction. One issue is there is only a

short time period between the base year of the instrument and the years included in the regression. We also experiment using a longer gap between the base year of the instrument and the years in the regression and this does not significantly change the results.

In short, output growth seems to have little relationship with poverty over the period we study. However, the composition of the population did matter, according with McCulloch's (2003) finding that personal characteristics are more important than local labour market strength. It also supports the pessimistic national narrative about the disconnect between growth and living standards (Resolution Foundation, 2013). But focusing purely on poverty may ignore two significant forms of variation. First, employment may actually be increasing. Second, wages may be increasing for other groups in the labour market – the question of who gains from growth remains important. We next consider these two issues.

5. Growth and the labour market

The impact on poverty at a city level may happen in several ways, but the most direct channels are through employment creation and/or increased wages, so the primary channel through which economic growth will impact on poverty is through the labour market. To test our results in table 3, we then assess first the extent to which economic growth is effectively drawing workers at risk of poverty into employment before considering how wages at different percentiles are affected by growth. We use a similar empirical framework to that in equation 1, but with different dependent variables, to test the relationship between growth and both low skilled employment rates and the wage distribution.

Economic growth and the low skilled labour market

For growth to be inclusive, it should improve outcomes for those who are most at risk of poverty. So an important question is the extent to which growth is increasing employment rates for those at risk of poverty. As low skill levels are one of the most significant risk factors, table 4 repeats the previous analysis with a new dependent variable: the employment rate for those with qualifications equivalent to National Vocational Qualification (NVQ) level 2 or below (these are equivalent to high school leaving examination results at grade A-C).

Insert table 4 around here

The results are presented in table 4. Overall, they suggest that economic growth in this period had little impact on the low skilled employment rate. There is one exception – an association at the 10% statistical significance level with total GVA growth. This overall lack of results is not necessarily surprising. First, this was a period in which economic change was biased against low skilled groups. It may be that any growth effects were simply too small relative to the changing structural characteristics of the labour market. Second, growth in the 2000s was heavily unbalanced across Britain, with the strongest growth in London and other cities in the south of England. These cities had tight labour markets and unemployment was not due to weak labour demand. Those out of work faced other barriers to participation (such as caring issues) rather than a lack of employment opportunities (Gordon & Turok, 2005). Finally, at the same time the government was focused on increasing employment rates for workers regardless of location (Adam and Green, 2016). So it might be that active labour market policies were increasing employment rates nationally and, because the cities which were experiencing slower growth had more unemployed, this national level policy was reducing the importance of local growth as a tool to increase low skilled employment rates. However, in this latter case we might expect wages

to have increased at the lower end of the distribution, as increased demand in the context of a tight labour market fed through into wages.

Economic growth and wage growth

We next consider which parts of the wage distribution gain from growth to assess whether growth benefits higher or lower earners. If growth had simply increased wage inequality, this would show up in an association with growth at the top but not the bottom of the distribution. To test this, we estimate the model from table 3 but our dependent variables are different percentiles of the wage distribution without controls. We test the 10th and 20th percentiles to give an indicator of the low-wage labour market, the median, and the 80th and 90th percentiles which are the high-wage labour market. We do not assume that this is a causal relationship, but present these as descriptive statistics to investigate associations. If the results of growth were evenly shared over this period, we would expect economic growth to have been associated with wage growth at all points of the distribution.

Insert table 5 around here

The results are given in table 5. The results strongly show that output growth is associated with the upper part of the wage distribution. The first panel considers the growth rate of GVA per capita: in both cases, there are positive and significant relationships with the 80th and 90th percentiles of the wage distribution but no other percentiles. The second indicator, growth in GVA per worker, is also statistically significantly related to the median wage and with the 10th percentile, although this latter result is only statistically significant at the 10% level (and may well be driven by selection effects, as if low wage workers are out of the labour market this will increase both the 10th wage percentile and GVA per worker). The third indicator, the growth rate of GVA per capita, is only associated with growth at the 80th and 90th percentiles. The results are very similar when considering the two indicators included as levels, rather than growth rates, with both GVA per capita and GVA per worker associated with the 80th and 90th percentiles. GVA per worker is also associated with the median wage, but only at the 10% significance level.

In short, there is little relationship between growth and low wage percentiles but a consistent and statistically significant relationship above the median. The period of our analysis saw significant economic change which often held down wages at the bottom of the wage distribution, such as technological change and falling union membership (Breau and Essletzbichler, 2013). But domestic British factors will also have been important. Growth in this period was biased towards relatively few sectors and geographically (Stewart, 2011). Evidence from sectoral growth in United States cities, for example, shows that growth sectors such as high-technology industries

have a positive impact on wages in cities, but that these positive effects only apply for families with incomes over 180% of the poverty line (Lee & Rodriguez-Pose, 2016. Instead, the benefits of growth fell to high wage earners. This is consistent with national level evidence of growing wage inequality in this period, by some measures, driven by inequality towards the top of the distribution (Hills et al., 2010).

These results reflect this pattern of growth spatial inequality, with higher wages for workers in rapidly growing cities in the South of England, driven by growth in employment and wages at the top of the distribution. Yet wages at the bottom of the distribution do not seem to respond in the same way, perhaps reflecting growth in the share of low-paid service employment and so growing employment polarization, a process noted in all British regions between 1997-2007 (Jones and Green, 2009). Our results suggest that over this period the wage benefits from growth accrued primarily to high earners, with low-earners appearing to derive much less benefit. In this respect, they run counter to earlier models which tended to view employment growth and output growth as working together. If the benefits of new output are focused on a smaller share of workers, this assumption may not hold.

6. Conclusions

This paper has investigated the relationship between economic growth and poverty in British cities. Our central finding is that there was little relationship between economic growth and poverty reduction in that period. This result is robust to both a number of different indicators of growth and IV estimation. We also find no evidence that urban growth increased the low skilled employment rate. Yet, we do find that economic growth is associated with wages growth above the median (but not below). Overall, these results suggest a disconnect between economic growth and the living standards of those on low incomes. We find little evidence of positive wider social impacts or "inclusive growth" (OECD, 2014).

The 2000's were a period of growing spatial inequality in Britain, with economic growth more rapid in London and the cities of the South East than in many of the less affluent cities in the rest of the country (Champion & Townsend, 2011; Gardiner et al., 2013). At the same time, there were reductions in poverty in many lagging cities. Our analysis adds to this picture by demonstrating that the gains of growth tended to accrue to well paid workers at the top of the distribution, supporting similar findings at a national level (Lansley & Reed, 2013; Mishel et al., 2009). One reason for this may be increasingly polarized employment structures in much of the Britain. In their analysis of regional employment structures in the decade from 1997, Jones and Green (2009) show increasing employment polarization in all mainland regions but particularly in London and the South East. Given this growth at the top and bottom of the distribution, our finding that growth is associated with growing wage inequality is unsurprising, as patterns of employment polarization will be reflected in patterns of wage growth.

Our results have implications for policy and research on inclusive growth. The main implication is that greater policy effort is needed to ensure that the labour market benefits of economic growth translate into jobs for those at risk of poverty. The policy frameworks which might make growth inclusive are not well defined (Turok, 2010), but initiatives might include better job matching between new developments and deprived groups, tailored skills provision to help residents access new employment opportunities or even selective recruitment by major employers. At the same time, our results challenge the view that there will be trickle-down effects at a local level from higher wage earners onto the lower skilled labour market – a rising tide does not lift all boats, but only those above the median. So rather than assuming that this will happen, policymakers could usefully attempt to investigate ways of making it so: this might involve living wage campaigns or skills upgrading to improve worker productivity. As cities increasingly focus on the notion of inclusive growth (OECD, 2016), new policy frameworks will need to develop.

Efforts to make growth inclusive will need to be very different in different places. The advantage of a local approach is that the composition of growth – in terms of sectors or job creation – will vary, and local actors may be better able to reflect this specificity and develop coalitions between different institutions to ensure growth and poverty reduction are linked (Turok, 2010). In cities like London, which experienced strong growth but little reduction in aggregate poverty, the focus on inclusive growth seems clearly warranted. Given evidence on rising inequality in the city (Stewart, 2011) and the continued strong growth, even throughout the crisis, policies around job quality, skills, and other labour market initiatives are likely to be appropriate.

Yet the challenge of inclusive growth is twofold. In many cities, simply achieving growth has been hard, with inclusion only a secondary aim. Economic growth in the 2000s was highly uneven, and this pattern looks to have continued in the early 2010s (Martin et al., 2015). So the first step in inclusive growth in some British cities needs to be growth. In this context, it is important to caveat the potential of the inclusive growth concept as a way of addressing poverty. While cities are increasingly interested in achieving inclusive growth (OECD, 2016) the reductions in poverty over the 2000s were largely a result of national actions. Clearly, any local level action on poverty reduction needs to be considered alongside ongoing national level efforts.

The paper's main contribution to the literature is as the first to quantitatively investigate the links between economic growth and poverty reduction at the sub-national level in Great Britain. However, there are a number of limitations to the evidence presented here. First, there are limitations associated with our poverty indicator. In particular we use a proxy measure for household poverty. While poverty risk is much higher among benefit claimants (who are captured by our measure) there is a growing concern in the Great Britain about in-work poverty, at present however there are no survey measures which adequately capture the prevalence of this at sub-regional level. For this reason we also assess the impact of growth on the low-wage labour market. Secondly, we do not consider the nature of economic growth in great detail, but other work suggests this may be important (Goetz et al., 2011). There is therefore scope for future work to assess the importance of the factors such as the sectoral composition and physical location of growth.

The research opens up a number of potential areas for future research. First, the results here are for a specific proxy measure of poverty for a specific period in the British economic history. Future work could extend this to investigate robustness to alternative measures of poverty and for other countries. For example, there may be some insights from the study of countries such as Canada in which productivity did not experience the same disconnect from the median wages (Furman, 2014). Second, we only consider nominal income and do not take into account housing

costs. In his study of the top 1% of income earners in US cities, Essletzbichler (2015) shows that higher living costs reduce any trickle-down benefits they may have on other earners. Similar results may apply here, and it is possible that growth would be associated with increased cost of living. This is a particular problem in the British housing market where over recent decades house price rises have significantly outpaced wage growth (Houston and Sissons, 2012). This is an important area for future research, particularly in the context of larger cities such as London – with city size being an important potential mitigating factor behind the relationship. Moreover, our results are for output growth. Future work may also want to investigate how employment growth influences poverty both generally and also according to the sector of employment.

Acknowledgements

This research was funded by the Joseph Rowntree Foundation. We would like to thank the project manager, Josh Stott, for his help and support. We also gratefully acknowledge the help of Alex Fenton, Ruth Lupton and Amanda Fitzgerald in providing access to the Unadjusted Means-tested Household Benefit Rate (UMBR). We would also like to thank the three anonymous referees for helpful comment along with Ceri Hughes, Anne Green, Duncan Adam, Gaby Atfield, Tony Champion and Andrés Rodríguez-Pose. The data we have used is Crown Copyright and has been made available by the Office for National Statistics (ONS) through the Data Archive and through NOMIS. It is reproduced with permission. Neither the ONS, NOMIS, nor the Data Archive bears any responsibility for the analysis and interpretation of the data presented in this study. The authors would also like to acknowledge the help of the Secure Data Service in accessing LFS and ASHE data.

Bibliography

Adam, D. & Green, A. 2016. Soft spaces and soft outcomes: Experiences from city strategy on local partnership working and measures of success. *Environment and Planning A,* DOI: 10.1177/0308518X16642225

Bartik, T. 1996. The distributional effects of local labor demand and industrial mix: Estimates using individual panel data. *Journal of Urban Economics*, 40 (2), 150-178.

Bolton, K., & Breau, S. 2011. Growing Unequal? Changes in the Distribution of Earnings across Canadian Cities. *Urban Studies*, ***49***(6), 1377–1396.

Breau, S., Kogler, K. C., & Bolton, K. 2014. On the Relationship between Innovation and Wage Inequality: New Evidence from Canadian Cities. *Economic Geography*, **90**(4), 351-373.

Breau, S. & Essletzbichler, J. 2013. Contesting inequality. *Environment and Planning A*, 45, 1775-1784.

Brewer, M., 2012 Child poverty and financial support for children in L. Judge (ed.) *Ending child poverty by 2020: Progress made and lessons learned* London: Child Poverty Action Group

Champion, T., & Townsend, A. 2011. The Fluctuating Record of Economic Regeneration in England's Second-order City-regions, 1984-2007. *Urban Studies*, **48**(8), 1539–1562.

Champion, T., & Townsend, A. 2013. Great Britain's second-order city regions in recessions. *Environment and Planning A*, **45**(2), 362–382.

Coombes, M., and Bond, S. 2008 *Travel-to-Work Areas: the 2007 review*. Office of National Statistics: London.

Cribb, J., Hood, A., Joyce, R. and Philips, D. 2013 *Living standards, poverty and inequality in the UK: 2013* London: Institute for Fiscal Studies

Cunliffe, J., Fenton, A., Fitzgerald, A., Gambaro, L., Lupton, R. and Vizard, P. (2013) *Prosperity, Poverty and Inequality in London 2000/01–2010/11* Research Report 3. London: London School of Economics and Centre for Analysis of Social Exclusion

Dollar, D., Kleineberg, T., & Kraay, A. 2013. Growth still is good for the poor. *World Bank Policy Research Working Paper*, *6568*(August).

Dollar, D., & Kraay, A. 2002. Growth is Good for the Poor. *Journal of Economic Growth*, **7**, 195–225.

Dolphin, T., and Hatfield, I. 2015 The missing pieces: Solving the UK's productivity puzzle London: IPPR.

Dorling, D. 2012. Editorial – Inequality and Injustice: Some News from Britain. *Urban Geography,* **33**(5), 621-629.

Dustmann, C., & Frattini, T. 2011. Immigration: the European Experience. *CReAM Discussion Papers*, **22/11**, 1–49.

Essletzbichler, J. 2015. The top 1% in US metropolitan areas *Applied Geography,* **61**, 35-46.

European Commission. 2014. *Promoting inclusive growth*. Luxembourg, European Union.

Fahmy, E., Gordon, D., Dorling, D., Rigby, J. and Wheeler, B. 2011. Poverty and place in Britain, 1968 - 99. *Environment and Planning A,* **43**, 594-617.

Fenton, A. 2013 Small-Area Measures of Income Poverty. *CASE Papers* No. 173, London School of Economics.

Ferreira, F. H. G., Leite, P. G., & Ravallion, M. 2010. Poverty reduction without economic growth? *Journal of Development Economics*, **93**(1), 20–36.

Florida, R., & Mellander, C. 2014. The Geography of Inequality: Difference and Determinants of Wage and Income Inequality across US Metros. *Regional Studies*, 1–14.

Fowler, C., & Kleit, R. 2014. The Effects of Industrial Clusters on the Poverty Rate. *Economic Geography*. **90**(2), 129-154.

Fry, R. 2010 Understanding household income poverty at small area level. *Regional Trends 43*: Office for National Statistics

Furman, J. 2014. Global Lessons for Inclusive Growth. *White House Institute for Economic Affairs*, 1–18.

Gambaro, L., Joshi, H., Lupton, R., Buttaro, A., & Lennon, M-C. 2014. *A Pragmatic Approach to Measuring Neighbourhood Poverty Change* DQSS Working Paper no. 14-08

Gardiner, B., Martin, R., Sunley, P., & Tyler, P. 2013. Spatially unbalanced growth in the British economy. *Journal of Economic Geography*, **13**(6), 889–928.

Glaeser, E. L., Resseger, M., & Tobio, K. 2009. Inequality in Cities. *Journal of Regional Science*, **49**(4), 617–646.

Goetz, S. J., Partridge, M. D., Rickman, D. S., & Majumdar, S. 2011. Sharing the gains of local economic growth: race-to-the-top versus race-to-the-bottom economic development. *Environment and Planning C: Government and Policy*, **29**(3), 428–456. doi:10.1068/c1077r

Gordon, I. 2011. *Local Unemployment through Boom and Bust: an examination of personal and spatial components of variations with the 2004-2010 APS*. Unpublished paper.

Gordon, I., & Turok, I. 2005. How urban labour markets matter. In N. Buck, I. R. Gordon, A. Harding, & I. Turok (Eds.), *Changing Cities: rethinking urban competitiveness, cohesion and governance*. Basingstoke: Palgrave Macmillan.

Gordon, I., & Kaplanis, I. 2014. Accounting for Big ‐ City Growth in Low ‐ Paid Occupations: Immigration and/or Service ‐ Class Consumption. *Economic Geography*, **90**(1), 67–90.

Green, A. 1988 The North-South Divide in Great Britain: An Examination of the Evidence *Transactions of the Institute of British Geographers,* **13**(2), 179-198.

Gregg, P., & Wadsworth, J. 2004. Two sides to every story: Measuring the polarisation of work. *CEP Discussion Paper*, (632).

Hills, J. 2014. *Good times, bad times: The welfare myth of them and us*. Bristol: Policy Press.

Houston, D. 2005. Employability, skills mismatch and spatial mismatch in metropolitan labour markets. *Urban Studies*, **42**(2), 221–243.

Houston, D., and Sissons, P. 2012 The changing geography of privately rented housing in England and Wales. *Urban Studies,* **49**(4), p.795-819.

Jones, P. and Green, A. 2009 The quantity and quality of jobs: Changes in UK regions, 1997 – 2007. *Environment and Planning A,* **41**, 2474-2495.

Joseph Rowntree Foundation 2014 *Poverty rates by region.* Source: http://data.jrf.org.uk/data/poverty-rate-region/ [Accessed 2nd September 2015]

Kaplanis, I. 2010a. Local human capital and its impact on local employment chances in Britain. *Spatial Economics Research Centre Working Paper, 40.*

Kaplanis, I. 2010b. Wage Effects from Changes in Local Human Capital in Britain. *Spatial Economics Research Centre Working Paper*, 39.

Kraay, A. 2006. When is growth pro-poor? Evidence from a panel of countries. *Journal of Development Economics*, **80**(1), 198–227.

Lansley, S., & Reed, H. 2013. *How to boost the wage share*. London: Trade Union Congress.

Lee, N. 2014. The creative industries and urban economic growth in the UK. *Environment and Planning A*, **46**(2), 455–470.

Lee, N., & Rodríguez-Pose, A. 2013. Innovation and spatial inequality in Europe and USA. *Journal of Economic Geography*, **13**(1), 1–22.

Lee, N., & Rodríguez-Pose, A. 2016. Is there trickle-down from tech? Is there trickle-down from tech? Poverty, employment and the high-technology multiplier in US cities. *Annals of the American Association of Geographers*, Forthcoming.

Lee, N., Sissons, P., Hughes, C., Green, A., Adam, D., Atfield, G., & Rodriguez-Pose, A. 2014. *Cities, Growth and Poverty: Evidence review*. York: Joseph Rowntree Foundation.

Loayza, N. V., & Raddatz, C. 2010. The composition of growth matters for poverty alleviation. *Journal of Development Economics*, **93**(1), 137–151.

Lupton, R., Vizard, P., Fitzgerald, A., & Fenton, A. 2013. Prosperity, poverty and inequality in London 2000/01-2010/11. *Social Policy in a Cold Climate Research Report*.

Martin, R., Pike, A., Tyler, P., and Gardiner, B. 2015. Spatially rebalancing the UK economy: Towards a new policy model? *Regional Studies,* DOI: 10.1080/00343404.2015.1118450

McCulloch, A. 2003. Local labour markets and individual transitions into and out of poverty: evidence from the British Household Panel Survey. *Environment and Planning A:* **35**, 551 - 568

Mishel, L., Bernstein, J., & Shierhol, H. 2009. *The State of Working America , 2006 / 2007*. Ithaca: Cornell University Press.

Nathan, M. 2010. The Long Term Impacts of Migration in British Cities: Diversity, Wages, Employment and Prices. *SERC Discussion Paper 69,* London School of Economics and Political Science

New Policy Institute 2013 *London's poverty profile, 2013*. New Policy Institute: London.

OECD. 2014. *All on board: Making inclusive growth happen*. Paris: OECD.

OECD. 2016. *The New York Proposal for Inclusive Growth in Cities*. Paris: OECD.

Office for National Statistics (2010) *NUTS3 Regional GVA 1997-2009*. ONS, Newport.

Office for National Statistics (2012) *Annual Survey of Hours and Earnings, 1997-2011: Secure Data Service Access* [computer file]. *3rd Edition.* Colchester, Essex: UK Data Archive [distributor], June 2012. SN: 6689, http://dx.doi.org/10.5255/UKDA-SN-6689-2

Office for National Statistics, Social Survey Division and Northern Ireland Statistics and Research Agency. (2013) Central Survey Unit, *Quarterly Labour Force Survey, 1992-2011: Secure Access* [computer file]. *3rd Edition.* Colchester, Essex: UK Data Archive [distributor], May 2013. SN: 6727, http://dx.doi.org/10.5255/UKDA-SN-6727-4

Parkinson, M. et al 2006 *State of the English Cities: Volumes 1*, Office of the Deputy Prime Minister: London

Partridge, M. D. 2005. High-Poverty Nonmetropolitan Counties in America: Can Economic Development Help? *International Regional Science Review*, **28**(4), 415–440.

Partridge, M. D., & Weinstein, A. L. 2012. Rising Inequality in an Era of Austerity: the Case of the US. *European Planning Studies*, 1–23.

Partridge, M., & Rickman, D. 2008a. Distance from urban agglomeration economies and rural poverty. *Journal of Regional Science*, **48**(2), 285–310.

Partridge, M., & Rickman, D. 2008b. Does a Rising Tide Lift All Metropolitan Boats? Assessing Poverty Dynamics by Metropolitan Size and County Type. *Growth and Change*, **39**(2), 283–312.

Pessoa, J. P. & Van Reenen, J. 2013 Decoupling of wage growth and productivity growth? Myth and Reality. *CEP Discussion Paper,* 1245, London School of Economics & Political Science.

Phimister, E., Theodossiou, I., & Upward, R. 2006. Is it easier to escape from low pay in urban areas? Evidence from the United Kingdom. *Environment and Planning A*, **38**(4), 693–710.

Pike, A., Rodríguez-Pose, A., Tomaney, J., Torrisi, G., & Tselios, V. 2012. In search of the economic dividence of devolution: spatial disparities, spatial economic policy and decentalisation in the UK. *Environment and Planning C: Government and Policy*, **30**(1), 10–28.

Piketty, T. 2014 *Capital in the Twenty-First Century,* Boston: Harvard University Press.

Ravallion, M. 2001. Growth, Inequality and Poverty: Looking Beyond Averages. *World Development*, **29**(11), 1803–1815.

Resolution Foundation 2012 *Gaining from growth: The final report of the Comission on Living Standards*. London: Resolution Foundation.

Rupasingha, A., & Goetz, S. J. 2011. Self-employment and local economic performance: Evidence from US counties*. *Papers in Regional Science*, **92**(1), 141-161.

Sassen S, 2001. The Global City: New York, London, Tokyo (Princeton University Press, Princeton, NJ)

Scottish Government. 2015. *Scotland's Economic Strategy,* Edinburgh: Scottish Government.

Stewart, M. B. 2011. The Changing Picture of Earnings Inequality in Britain and the Role of Regional and Sectoral Differences. *National Institute Economic Review,* 218 (1), R20 – R30.

Stewart, K. 2014. Employment Trajectories and Later Employment Outcomes for Mothers in the British Household Panel Survey: An Analysis by Skill Level. *Journal of Social Policy*, **43**(01), 87–108.

Storper M, 2013. *Keys to the city: How economics, institutions, social interaction and politics shape development*. Oxford: Princeton University Press.

Strait, J. B. 2001. The Disparate Impact of Metropolitan Economic Change: The Growth of Extreme Poverty Neighborhoods, 1970-1990. *Economic Geography*, **77**(3), 272. doi:10.2307/3594075

Turok, I. 2010. "Inclusive Growth: Meaningful goal or mirage" in Pike et al. (eds). *Handbook of Local and Regional Development*, London: Routledge, 74-86.

Van der Waal, J., & Burgers, J. 2009. Unravelling the Global City Debate on Social Inequality: A Firm-level Analysis of Wage Inequality in Amsterdam and Rotterdam. *Urban Studies*, **46**(13), 2715–2729.

Wang, M., Kleit, R. G., Cover, J., & Fowler, C. S. 2011. Spatial Variations in US Poverty: Beyond Metropolitan and Non-metropolitan. *Urban Studies*, **49**(3), 563–585.

Wills, J., & Linneker, B. 2014. In-work poverty and the living wage in the United Kingdom: a geographical perspective. *Transactions of the Institute of British Geographers*, **39**(2), 182–194. doi:10.1111/tran.12020

World Bank (2012) Uganda - Promoting Inclusive Growth: Transforming Farms, Human Capital and Economic Geography. World Bank Report 67377-UG , Washington DC.

Tables

Table 1. Variables, sources and descriptive statistics

Variable	Source	Mean	SD
Households in poverty (%, UMBR Measure)	DWP/ONS	0.20	0.06
GVA per capita growth rate (%)	ONS	0.04	0.03
GVA per worker growth rate (%)	ONS	0.05	0.03
Total GVA growth rate (%)	ONS	0.04	0.03
GVA Per Capita (ln)	ONS / ABI	-3.65	0.24
GVA Per Worker (ln)	ONS / ABI	-3.29	0.15
Lone parents as % of total population (ln)	LFS	1.93	0.26
Degree holders as % of total population (ln)	LFS	2.71	0.36
Females as % of total population (ln)	LFS	3.93	0.01
Aged under 16 as % of total population (ln)	LFS	2.96	0.08
Born abroad as % of total population (ln)	LFS	8.68	5.38

60 TTWA's; 480 Observations. Where: LFS = Labour Force Survey, ABI = Annual Business Inquiry, ONS = Office of National Statistics, DWP = Department for Work and Pensions.

Table 2. Relationship between growth and poverty: Fixed effects panel regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	% of households in poverty (UMBR measure)									
GVA per capita growth rate (%)	-0.00968					-0.0133*				
	(0.00827)					(0.00772)				
GVA per worker growth rate (%)		-0.0206**					-0.0118			
		(0.00857)					(0.00751)			
Total GVA growth rate (%)			-0.0129					-0.0168*		
			(0.00866)					(0.00841)		
GVA per capita (ln)				0.0163					-0.00784	
				(0.0155)					(0.0154)	
GVA per worker (ln)					0.0328**					0.00730
					(0.0162)					(0.0154)
Lone Parents as % of total population (ln)						-0.000424	-0.000309	-0.000435	-0.000330	-0.000217
						(0.00165)	(0.00165)	(0.00164)	(0.00167)	(0.00163)
Degree holders as % of total population (ln)						-0.00211	-0.00215	-0.00209	-0.00228	-0.00222
						(0.00230)	(0.00228)	(0.00230)	(0.00232)	(0.00225)
Females as % of total population (ln)						0.512**	0.511**	0.512**	0.546**	0.509**
						(0.232)	(0.231)	(0.231)	(0.236)	(0.232)
Aged under 16 as % of total population (ln)						0.169***	0.163***	0.169***	0.167***	0.162***
						(0.0439)	(0.0440)	(0.0438)	(0.0456)	(0.0439)
Born abroad as % of total population (ln)						0.00110	0.000958	0.00112	0.00110	0.000955
						(0.00158)	(0.00158)	(0.00157)	(0.00155)	(0.00159)
Constant	0.205***	0.205***	0.205***	0.263***	0.309***	0.838***	0.829***	0.840***	0.832***	0.849***
	(0.000767)	(0.000745)	(0.000747)	(0.0552)	(0.0515)	(0.118)	(0.118)	(0.117)	(0.119)	(0.119)
Year FE's	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	480	480	480	480	480	480	480	480	480	480
R-squared	0.117	0.126	0.119	0.122	0.137	0.350	0.349	0.354	0.346	0.346
Number of TTWA	60	60	60	60	60	60	60	60	60	60

Estimated as fixed effects models with robust standard errors (in parentheses). All models include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Instrumental variables estimation

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome variable:	% of households in poverty (UMBR measure)					
GVA per capita growth rate (%)	-0.0882			0.277		
	(0.0584)			(0.957)		
GVA per worker growth rate (%)		-0.0996			-0.0632	
		(0.133)			(0.129)	
Total GVA growth rate (%)			-0.347			-0.0373
			(2.330)			(0.0468)
	0.210***	0.210***	0.222**	0.798***	0.745***	0.795***
Constant	(0.00238)	(0.00474)	(0.106)	(0.155)	(0.166)	(0.113)
	(0.301)	(0.00376)	(0.00297)	(0.162)	(0.0943)	(0.0636)
Controls	No	No	No	Yes	Yes	Yes
Observations	480	480	480	480	480	480
Number of code	60	60	60	60	60	60
F-stat	748.25	672.72	154.88	78.88	354.24	398.5
P value of f-stat	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 4. Relationship between growth and the low skilled employment rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Outcome variable:	Low skilled employment rate (%)									
GVA per capita growth rate (%)	-8.090					-6.585				
	(4.962)					(4.822)				
GVA per worker growth rate (%)		-4.559					-4.917			
		(5.265)					(5.251)			
Total GVA growth rate (%)			-8.861*					-7.442		
			(5.056)					(5.008)		
GVA per capita (ln)				-1.027					2.443	
				(6.755)					(6.510)	
GVA per worker (ln)					-10.10					-9.608
					(6.463)					(6.504)
Lone Parents as % of total population (ln)						-1.649	-1.590	-1.647	-1.566	-1.669
						(1.082)	(1.104)	(1.079)	(1.083)	(1.091)
Degree holders as % of total population (ln)						-2.026	-2.061	-2.026	-2.171	-2.328*
						(1.393)	(1.417)	(1.391)	(1.404)	(1.389)
Females as % of total population (ln)						27.00	27.34	27.78	24.62	48.30
						(73.19)	(71.80)	(72.94)	(71.21)	(71.34)
Aged under 16 as % of total population (ln)						-33.61**	-36.09**	-33.56**	-36.49**	-32.58**
						(14.84)	(14.76)	(14.78)	(14.70)	(14.20)
Born abroad as % of total population (ln)						-1.939**	-2.009**	-1.935**	-2.067**	-2.041**
						(0.801)	(0.813)	(0.803)	(0.802)	(0.814)
Constant	68.83***	68.66***	68.90***	64.59**	33.71	44.80	41.06	45.47	48.07	28.35
	(0.395)	(0.389)	(0.413)	(25.65)	(22.23)	(47.92)	(48.05)	(47.69)	(49.91)	(47.45)
Year FE's	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	480	480	480	480	480	480	480	480	480	480
R-squared	0.238	0.233	0.240	0.231	0.239	0.273	0.270	0.274	0.269	0.274
Number of TTWA	60	60	60	60	60	60	60	60	60	60

Estimated as fixed effects models with robust standard errors (in parentheses). All models include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Relationship between growth and wages at different percentiles

	(1)	(2)	(3)	(4)	(5)
	10th Wage percentile	20th Wage percentile	Median wage	80th Wage percentile	90th Wage percentile
Indicator 1:					
GVA per capita growth rate (%)	0.0120	0.0101	0.0455	0.138***	0.200***
	(0.0488)	(0.0450)	(0.0448)	(0.0384)	(0.0458)
Constant	2.919***	3.409***	4.442***	4.908***	4.372***
	(0.520)	(0.459)	(0.460)	(0.530)	(0.767)
R-squared	0.936	0.941	0.939	0.901	0.868
Indicator 2:					
GVA per worker growth rate (%)	0.0784*	0.0571	0.123***	0.171***	0.199***
	(0.0403)	(0.0354)	(0.0396)	(0.0499)	(0.0587)
Constant	2.981***	3.454***	4.538***	5.040***	4.524***
	(0.517)	(0.458)	(0.442)	(0.513)	(0.751)
R-squared	0.937	0.941	0.940	0.902	0.868
Indicator 3:					
Total GVA growth rate (%)	0.00432	0.00282	0.0398	0.125***	0.193***
	(0.0477)	(0.0455)	(0.0448)	(0.0383)	(0.0457)
Constant	2.918***	3.409***	4.438***	4.896***	4.354***
	(0.520)	(0.458)	(0.461)	(0.534)	(0.772)
R-squared	0.936	0.941	0.939	0.901	0.868
Indicator 4:					
Total GVA per capita (ln)	0.0240	0.0135	0.0117	0.189**	0.185**
	(0.0685)	(0.0629)	(0.0609)	(0.0739)	(0.0845)
Constant	2.949***	3.426***	4.456***	5.145***	4.602***
	(0.532)	(0.463)	(0.453)	(0.507)	(0.756)
R-squared	0.936	0.941	0.939	0.902	0.867
Indicator 5:					
Total GVA per worker (ln)	0.0385	0.0242	0.106*	0.154**	0.212***
	(0.0580)	(0.0461)	(0.0558)	(0.0713)	(0.0745)
Constant	2.985***	3.451***	4.625***	5.171***	4.734***
	(0.534)	(0.454)	(0.493)	(0.563)	(0.792)
R-squared	0.936	0.941	0.940	0.901	0.867

Each panel reports the results from fixed effects panel regressions between the five indicators of 'growth' and one of five percentiles of the wage distribution. Estimated as fixed effects models with robust standard errors (in parentheses). All models include year fixed effects. Observations: 480. TTWA: 60.
*** p<0.01, ** p<0.05, * p<0.1

Figure 1. Poverty rate in 2001 and change between 2001 – 2008